

Hearing Conservation

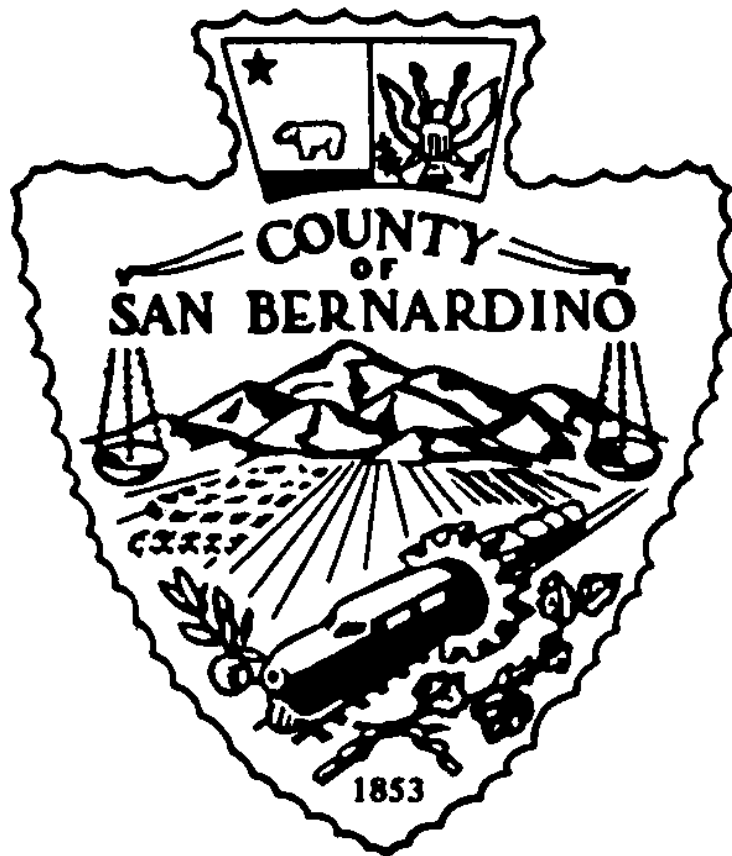


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NOISE CONTROL AND HEARING CONSERVATION

SCOPE

This establishes the County of San Bernardino procedure for noise control and hearing conservation. It provides information and guidance on the process of identifying noise hazards and includes guidelines to be used by County departments in preparing individualized programs. It also provides procedure to ensure appropriate medical monitoring for those employees exposed to excess noise during the course of employment. The program identifies documentation, communication, and training necessary to ensure the health and safety of County employees. **This procedure sets forth minimum standards for all County departments.** Individual departments may implement more stringent standards. Copies of department prepared programs are to be provided Risk Management Division/Safety Section, upon request, as well as included in the immediately following divider labeled "Department Program".

PURPOSE

Title 8, California Code of Regulations, General Industry Safety Orders, Article 105 requires employers to establish an effective Hearing Conservation Program including procedures for employee training, noise monitoring and medical surveillance. Section 3203 of the above referenced code requires employers to prepare written programs relative to the prevention of occupational illness, injury and injurious exposure.

INTRODUCTION

Department management, supervisors, employees, Risk Management Division/Safety Section and the Center for Employee Health and Wellness shall share responsibilities for implementing and maintaining an effective Noise Control and Hearing Conservation Program within the County of San Bernardino.

RESPONSIBILITIES OF MANAGEMENT

Department management and supervisors have the following responsibilities with regard to Noise Control and Hearing Conservation:

1. Ensure the implementation of the Noise Control and Hearing Conservation Program throughout all departments within the County.
2. Authorize budgeting and expenditure of necessary resources to implement the program.
3. Provide corrective action as may be deemed necessary or practical to modify or replace equipment, machinery, facilities and tools which are found to create noise levels above exposure limits if technologically feasible.
4. Request Risk Management Division/Safety Section to study specific operations, facilities, and equipment to determine employee noise level exposure.
5. Ensure that employees undergo annual Audiometric examination (baseline, annual, and termination) as deemed necessary by Risk Management Division/Safety Section and the Medical Director.

Supervisors of employees in areas or operations which have been determined to have noise levels above acceptable or controllable levels shall:

1. Arrange to have exposed employees equipped with approved hearing protection devices as prescribed by Risk Management Division/ Safety Section and the Medical Director.
2. Conduct training and make frequent checks to ensure employees are properly using hearing protection devices. Strictly enforce the use of hearing protection devices where determined necessary.
3. Cooperate with Risk Management Division/ Safety Section and the Center for Employee Health and

Wellness in completing required periodic audiometric examinations.

4. Ensure employees comply with requirements specified in Title 8, California Code of Regulations, General Industry Safety Orders, and the policies or procedures specified herein.
5. Utilize Risk Management Division/Safety Section to make sound level studies and surveys of specific equipment areas, facilities, work locations, and operations to determine the degree of employee noise level exposure.
6. Reevaluate work areas and locations where employees are known to be, or suspected of being, exposed to noise levels at or above an 8-hour time weighted average (TWA) of 85 dBA.
7. Authorize the use of hearing protection devices as necessary to comply with Title 8, Article 105.
8. Specify those areas, equipment, operations and employees having a noise exposure equal to or greater than 85 dBA time weighted average (TWA). Document those areas and send copy to Risk Management Division/ Safety Section.
9. Identify those areas and jobs where hearing protection is required. Document those areas and jobs and send copy to Risk Management Division/Safety Section.
10. Prepare an educational program on hearing conservation for employees.

DEFINITIONS

This glossary defines words and terms relevant to noise control and audiometry. It has been compiled to provide assistance in understanding terms used in this Section.

Action level - An 8-hour time weighted average of 85 decibels measured on the A-scale, slow response, or equivalently, a dose of fifty percent.

Audiogram - A chart, graph or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of hearing (from 500 to 6000 Hertz).

Audiologist - A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech-Language-Hearing Association or licensed by a state board of examiners.

A-Weighted Sound Level - (dBA) - The ear does not respond equally to all frequencies. Therefore, to obtain a single number representing the sound level of a noise containing a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce, or weight, the effects of the low and high frequencies with respect to the middle frequencies. The result and sound level is said to be A-weighted.

Baseline Audiogram - The audiogram against which future audiograms are compared.

Competent Person - One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Criterion Sound Level - A sound level of 90 decibels.

Daily Noise Dose - The cumulative noise exposure of an employee during a working day.

Decibel (dB) - A non-dimensional unit used to express levels. It is a logarithmic expression of the ratio of a measured quantity to reference quantity.

Dose - A single index number as defined by Cal/ OSHA.

Dosimeter - An instrument which registers the occurrence and accumulative duration of noise exceeding a predetermined level at a chosen point in the environment. As a calculation is based on the dose (Noise Exposure Index) concept, and is measured in a percent of the allowable limit.

Frequency - The time rate of repetition of a periodic phenomenon. It is expressed in Hertz (Hz), formerly in cycles per second (cps).

Hearing Conservation Program (HCP) - An integrated control program designed to prevent any significant permanent noise-induced hearing loss resulting from on-the-job noise exposure. An effective HCP will (a) identify and analyze the levels of noise exposure, (b) control the noise exposure by engineering controls, by the use of personal protective equipment, and/or administrative methods, (c) measure the degree of hearing loss (or confirm no loss) by pre-placement balance and periodic audiometric examinations.

Hearing Protector - A device inserted into or placed over the ear for the purpose of reducing air-conducted sounds, e.g. ear plugs or earmuffs.

Hearing Threshold Level (HTL) - The amount the threshold of hearing exceeds a standard audiometric reference. Units; decibels. Current levels are referenced to ANSI-1969 standard or ISO-1964 standard.

Hertz (Hz) - Unit of measurement of frequency, numerically equal to cycles per second.

Impulse of Impact Noise - A sound with a rise time of not more than 35 milliseconds to peak intensity and a duration of not more than 500 milliseconds to the time when the level is 20 dB below the peak. If the impulse recurs at intervals less than 1/2 second, they shall be considered as continuous noise.

Intermittent Noise - A steady state or continuous signal which is interrupted by periods of silence or periods of noise at levels below 55 dBA. Intermittent noise does not vary by more than 40 dBA in 500 milliseconds.

Noise - Disturbing, harmful or unwanted noise.

Noise Exposure Index - The integrated effect over a given time period at different noise levels and duration, often reported as a Dose.

Noise Induced Hearing Loss - The term used to refer to the slowly progressive inner ear hearing loss that results from exposure to continuous noise over a long time period as contrasted to acoustic trauma or physical injury to the ear.

Permanent Threshold Shift (PTS) - The component of threshold shift which shows no progressive reduction with passage of time when the apparent cause is removed.

Representative Exposure - Measurements of an employee's noise dose or 8-hour time-weighted average sound level that the employers deem to be representative of the exposure to other employees in the work place.

Sound Level Meter (SLM) - An instrument used to measure noise and sound levels, comprised of a microphone, amplifier, rectifier, output meter, and optional frequency-weighting networks.

Standard Threshold Shift - A change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 2000, 3000 and 4000 Hertz in either ear.

Steady-State Noise - Noises that are continuous or that consist of impulses spaced less than 0.5 seconds apart.

Time-Weighted Average Sound Level - That sound level, which if constant over an 8-hour exposure, would result in the same noise dose as is measured.

Threshold of Hearing - The lowest detectable level of audible sound reported as a function of frequency.

NOISE LEVEL EXPOSURE LIMITS

The following exposure limits are established to protect employees from harmful effects of noise in the workplace.

CONTINUOUS NOISE

Protection against the effects of noise exposure shall be provided when sound levels exceed those shown below when measured on the A-scale of standard Type II sound level meter at a slow response.

Permissible Noise Exposure Limits

Duration per day, hours	Sound level, dBA slow response
8	85
6	87
4	90
3	92
2	95
1.5	97
1	100
0.5	105
0.25 or less	110

IMPULSIVE OR IMPACT NOISE

Exposure to impulsive or impact noise shall not exceed 140 dBA peak sound pressure level as measured by an impulsive-type sound level meter.

MEASUREMENT OF NOISE LEVELS

Noise and levels of exposure shall be measured by a competent person using sound level meters meeting current ANSI S1.4 "Specification for Sound Level Meters", or dosimeters meeting current ANSI S1.25, "Specification for Personal Noise Dosimeters".

PERIODIC MONITORING OF NOISE LEVELS

Noise monitoring or measuring shall be conducted by Risk Management Division/Safety Section approved contractors when levels are, or suspected to be at or above 85 dBA; when employees complain of noise levels; or when supervisors believe that excessive noise exposure is occurring.

EMPLOYEE EXPOSURE TO NOISE LEVELS

As practical, exposure to excessive noise shall be eliminated by engineering and/or administrative controls.

HEARING CONSERVATION

If an employee's exposure to noise equals or exceeds an 8-hour time weighted average (TWA) sound level of 85 dBA, an effective Hearing Conservation Program shall be initiated. An exposure level of 85 dBA or greater will trigger the Hearing Conservation Program.

The Hearing Conservation Program shall contain three basic parts.

1. Assessment of Employee's Noise Exposure.
2. Control of Noise Exposure:
 - a. Engineering and/or Administrative Controls;
 - b. Hearing Protection Devices (to be used only after abatement of noise has been documented as engineering and/or economically infeasible).
3. Audiometric Testing.

NOISE MONITORING

The initiation of a monitoring program is to be considered whenever employees have:

1. Difficulty communicating by speech while they are in the noise area, and the listener and speaker face each other at a distance of two feet, or;
2. Employee complaints such as head noises or ringing in the ears after working in a noise area for extended periods, or;
3. A temporary loss of hearing that has the effect of muffling speech and other sounds after extended exposure to the noise.

Managers and Supervisors shall determine if any employee is exposed to a daily dose greater than exposure permitted under this program.

If routine/periodic survey monitoring identifies an employee for inclusion in a Hearing Conservation Program, additional monitoring shall be conducted to obtain measurements of other employees who may be similarly exposed.

HEARING PROTECTORS

Hearing protectors issued to employees shall provide a degree of protection to reduce noise exposure below limits prescribed.

Evaluation of hearing protection devices for specific noise environments shall be performed using one of the methods prescribed in the Cal/OSHA Hearing Conservation Amendment (29CFR 191095 Appendix B).

Those employees required to wear hearing protectors shall be given an opportunity to select hearing protectors from a variety (at least two) of suitable types (i.e. earplugs or earmuffs).

Procedures shall be established and implemented to ensure proper issuance, cleaning, maintenance and training in the use of hearing protectors.

Each employee receiving a pair of earplugs for reduction of exposure shall be fitted by an individual qualified and/or trained in the proper selection and fitting of ear plugs.

A variety of suitable hearing protectors (ear plugs and earmuffs) shall be made available to all identified employees. To ensure the required level of protection is achieved with ear plug-type protectors, a proper medical fit will be conducted.

Hearing protection will be worn if it is determined that a standard threshold shift has occurred as evidenced by audiometric testing.

AUDIOMETRIC TESTING AND EVALUATION

All employees identified by monitoring for inclusion in a Hearing Conservation Program shall be administered a preliminary (baseline) and subsequent (annual monitoring) audiometric (hearing) test. Annual re-testing shall be conducted so long as the employee meets the established exposure criteria. Audiometric testing shall be arranged and approved by the Medical Director, Center for Employee Health and Wellness, Human Resources.

RECORDKEEPING

Risk Management Division/Safety Section and the Center for Employee Health and Wellness shall establish a record keeping system which meets the requirements of Title 8, California Code of Regulations, General Industry Safety

Orders, Section 5100. These records shall be maintained for at least 30 years. The following shall be maintained:

1. Noise exposure measurements.
2. Audiometric test results including audiograms, name and classification of employee, date of audiogram, the name of the examiner, date of audiometer calibration and date of employee's last noise assessment.
3. Background noise levels in audiometric test rooms.
4. Training records.

ACCESS TO RECORDS

All records required shall be provided upon written request to affected employees, former employees, representatives designated by the individual employee or a designated representative of Cal/OSHA.

Managers and Supervisors will follow the San Bernardino County guideline to comply with requests for employee exposure and medical records.

TRAINING

Employees shall be informed of hazardous areas through appropriate signing and instructions. Hearing protectors shall not be issued to an employee until proper use and maintenance procedures have been demonstrated by the supervisor. All employee training shall be documented on a San Bernardino County training document form located in the Appendix.

TRAINING PROGRAM CONTENTS

Training sessions for employees identified for inclusion in a Hearing Conservation Program will include discussion of the effects of noise on hearing; the purpose of hearing protectors; use and care of hearing protectors; and the purpose and explanation of audiometric testing. The advantages and disadvantages of different hearing protectors, alternation of various types and instructions on selection and fitting, shall also be reviewed with

employees. Supervisors are to make use of audio/ visual and written materials available through Risk Management Division/ Safety Section in training programs.

ANNUAL TRAINING

Annual re-training will be required for employees exposed to excessive noise levels as specified in this procedure.

TECHNICAL EVALUATION

It is the policy of San Bernardino County to implement the practices outlined in the Appendices of Article 105, Control of Noise Exposures, Title 8, California Code of Regulations, General Industry Safety Orders, which deal with the technical aspects of noise control. These appendices are listed below:

1. Appendix A, Noise Exposure Computation.
2. Appendix B, Audiometric Measuring Instruments.
3. Appendix C, Audiometric Test Rooms.
4. Appendix D, Acoustic Calibration of Audiometers.
5. Appendix E, Methods of Estimating the Adequacy of Hearing Protection Attenuation.

To ensure that the practices outlined in the aforementioned Appendices are implemented throughout all departments, consultation services can be obtained through Risk Management Division/Safety Section. It is the responsibility of departmental management to either provide or arrange for consultation.

DISCIPLINARY ACTION

Employees who violate the provisions of the Hearing Conservation Program are subject to disciplinary action which may include warning, reprimand, suspension, reduction, or discharge from County services.

safety/docs/sftymnl/master/noise hearing.doc